Lead Program Report
Boulevard Sod/Soil Removal and Replacement in the Weston Area of Winnipeg, 1983

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ABSTRACT

Lead-in-soil surveys conducted in 1981 identified 27-15 meter (50 foot) sections of boulevard, located in the Weston area of the City of Winnipeg, which had levels of lead in sod and or soil in excess of 2600 µg/g. These sections were located on Bury Street, Quelch Street, Vine Street, Irysh Avenue, Catherine Avenue, Whyte Avenue, Gallagher Avenue and Logan Avenue. The Environmental Management Division recommends removal and or removal/replacement of soils having lead levels of 2600 µg/g or greater in areas which may be frequented by young children.

To facilitate the cleanup of these affected boulevard areas Proposal No. 31-48 S.P. "Request for Proposal for the Removal of Contaminated Material and Landscaping" was tendered in May, 1983 and was subsequently awarded to Lach Brothers Landscaping of Winnipeg.

Removal of the sod and soil, to a minimum depth of fifteen centimeters (6 inches) of the designated boulevards started on June 23 and was completed August 27 at a cost of $12,075. Approximately one hundred and fifty cubic meters of lead contaminated material was removed to the Brady Street landfill for disposal by the City of Winnipeg.

The contract required that the replacement material contain not more than 200 µg/g lead. All work was monitored by Environmental Management staff to ensure contract compliance. Quality control was maintained by pre- and post-replacement sampling of materials, provision of a maintenance clause in the contract and by regular site inspections. It was recommended that a sod and or soil removal/replacement program be undertaken in residential areas or any other area frequented by young children where lead levels are 2600 µg/g or greater.

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I INTRODUCTION

The Environmental Management Division has a concern for the potential health effects, especially for young children, of high lead-in-soil levels. In 1981 the Division adopted the Ontario Ministry of the Environment guideline for lead in soil. Soils with a lead content of 2600 µg/g or greater are recommended for removal and or removal/replacement in residential areas or other areas which may be frequented by young children.

In 1981 an intensive lead-in-soil survey was carried out in the vicinity of the Canadian Bronze Co. Ltd. located at 15 Bury Street. This survey identified levels of lead in soil at or in excess of 2600 µg/g on 31 private properties, on the picnic site of the Canadian Bronze Co. Ltd., and on 27-15 meter (50 ft.) sections of boulevard in the Weston area.

The Environmental Management Division recommended the removal and replacement of the sod and soil from these sites. In June of 1982 the Division supervised the removal/replacement of lead contaminated material from 26 of the residential properties and the Canadian Bronze picnic site.

It was initially anticipated that the City of Winnipeg would undertake the removal and replacement of the affected boulevards during the fall of 1982. Because removal/replacement was not undertaken by the City,

the Minister responsible for the Environment initiated provincial action in 1983. A contract for the work was subsequently tendered and awarded to Lach Brothers Landscaping Limited of Winnipeg. Work on the removal/replacement project began June 23, 1983.

II CONTRACT AWARDING

On May 27, 1983 Proposal #31-48 S.P. "Request for Proposal for the Removal of Contaminated Material and Landscaping" (Appendix I), was tendered by the Manitoba Department of Government Services, Purchasing Branch, to seven Manitoba landscaping companies. Two quotations were received, McEwen Bros. Ltd. of Winnipeg at $17,154 and Lach Brothers Landscaping Co. Ltd., also of Winnipeg, at $12,075.

In consideration of the estimates received, references and bidding details, Lach Bros. Co. Ltd. was awarded the contract.

III QUALITY CONTROL/MONITORING

The contract specified a replacement level of not more than 200 µg/g of lead for both sod and soil. The Division selected this level as it is generally recognized as an acceptable background level for lead in soil.

To ensure that the replacement material was less than the 200 µg/g specification the replacement sod and soil, at the Division's request, was isolated by Lach Bros. for sampling of lead content. A random collection of six samples were taken from each of the designated piles of sod and soil located at the Lach Bros. yard. Samples were submitted to the W. H. Ward Technical Services Laboratory for lead analysis. Results of the analyses indicated that all samples were below 50 µg/g.

On site supervision and monitoring of the removal/replacement process was provided by staff of the Environmental Management Division. As boulevard sections were completed samples of the replacement material were collected and analyzed for lead content to ensure contract compliance.

Formal site inspections were carried out by personnel of the Environmental Management Division and a representative of Lach Bros. on July 12, 18 and 27, 1983. In addition, the City of Winnipeg required that a final site inspection be carried out by the Superintendent responsible for Parks and Operations for this area. This inspection was to ensure compliance with the City of Winnipeg Standard Construction Specifications code CW3510-R2, for landscaping.

During the site inspection of July 12, the contractor was instructed to replace the new sod from the designated 15 meter section on Logan Avenue and a section on the southwestern corner of Quelch Street at Gallagher Avenue. In both cases the newly replaced sod was either

dead or in poor condition. Also at this time the contractor was asked to repair some automobile damaged sections of replaced material at three locations; the northwest corner of Quelch Street at Whyte Avenue, the southeast corner of Quelch Street north of Gallagher Avenue and the northeast corner of Quelch Street south of Gallagher Avenue.

The contract stipulated a thirty day maintenance clause which commenced following the July 12 inspection. During a subsequent site inspection on July 18 the sod was found to be growing poorly due to inadequate moisture. The contractor was instructed to increase the frequency and volume of watering.

On July 27 a third site inspection was carried out with representatives of the three interested parties to follow up on concerns for sod maintenance and growth. This inspection was attended by Mr. G. Lach, Manager of Lach Bros. Ltd., Mr. T. Bencharski, Superintendent of Parks and Operations Areas I and II for the City of Winnipeg and Mr. D. Jones, Environmental Management. The newly replaced sod was found to be severely desiccated, probably as a result of low moisture and high temperatures experienced during the month of July. In general the sod was found to be in one or more of the following conditions: weed infested due to poor grass survival, in a patchwork condition of green and brown, or almost entirely browned and dead. The contractor was instructed to replace sections of dead sod, to top dress and seed all of the replacement material and to increase substantially the volume and frequency of watering.

A final site inspection was carried out on August 27 with the same representatives from the City of Winnipeg, Lach Bros. and Environmental Management. At this time it was indicated, by Mr. Bencharski, that the condition of the sod met the required City of Winnipeg Standard Specifications code for landscaping. Following this final site inspection the contractor was released of any further maintenance obligations and as per Proposal #31-48 S.P. a letter of acceptance for work performed was forwarded to Lach Bros. Ltd. on September 14, 1983.

IV REPLACEMENT MATERIAL - LEAD MONITORING

Samples of replaced top soil and sod for all 27 boulevard locations were collected July 6 and July 12, 1983, (Appendix II). A water main break occurred during the early morning of July 7 on the east side of Quelch Street between Whyte Avenue and Gallagher Avenue. Because the break occurred after the newly replaced top soil had been sampled, there was a concern that the flooding may have deposited lead bearing street dust and debris on the new soil. Two soil check samples were collected after the area was cleaned up; each had 60 µg/g lead. Sod lead levels for this boulevard section collected July 12 were 40 µg/g and 30 µg/g.

Except for a 15 meter section of boulevard soil located at the northwest corner of Bury Street where 780 µg/g of lead were found,

all other sections were within the 200 µg/g replacement guideline. A summary of analytical results is presented in Appendix III.

On July 12 and 14 four soil check samples for the Bury Street northwest corner section were collected. Analyses for lead revealed levels of 450 µg/g, 320 µg/g, 160 µg/g and 120 µg/g. Because three of the five samples collected were in excess of the 200 µg/g guideline the contractor was instructed to remove the replacement sod and soil and replace it with fresh material. Some controversy arose because the contractor felt that the reason for the contamination was due to the high level of lead in the subsoil, (15-30 cm depth). He requested that lead samples of the subsoil be analysed prior to his replacing the topsoil and sod. The subsoil was sampled July 19 and 20 and showed lead levels of 200 µg/g, 130 µg/g, 1000 µg/g and 930 µg/g. A subsequent discussion with the site foreman revealed that the original replacement soil for the area had been stockpiled at an adjacent curb side. The topsoil intended for the northwest corner of Bury Street came from the last of the pile and may have incorporated contaminated street and gutter debris. As the reason for the higher lead levels was most likely from street contamination and because the subsoil levels were still below the 2600 µg/g lead-in-soil guideline, the contractor was instructed to comply with the original request. The second removal/replacement of this section was completed July 29, 1983. A check sample for lead in the second soil replacement revealed a level of 31 µg/g; the level in the sod was 38 µg/g.

V SUMMARY

The Environmental Management Division is concerned for the potential health effects associated with high lead-in-soil levels, in particular for young children.

In 1983 lead contaminated sod and soil on 27-15 metre (50 foot) sections of boulevard was removed and replaced with material having less than 200 µg/g lead content.

Lead-in-soil monitoring of replacement sod and soil both before and after the physical operation was essential to ensure quality control.

Site inspections and maintenance clauses ensured that contract obligations were fulfilled to the satisfaction of all parties involved.

Sod and soil removal and replacement is recommended for residential and other areas frequented by young children where lead concentrations are found to be 2600 µg/g or greater.

APPENDICES

APPENDIX I

CONTRACT SPECIFICATIONS

PROVINCE OF MANITOBA

DEPARTMENT OF GOVERNMENT SERVICES

PURCHASING BRANCH

REQUEST FOR PROPOSAL

FOR THE REMOVAL OF CONTAMINATED

MATERIAL AND LANDSCAPING

Proposals should be enclosed in a sealed envelope marked:

PROPOSAL #31-48 S.P.

Addressed to: Province of Manitoba
Purchasing Branch
529 Century Street
Winnipeg, Manitoba
R3C 0V8

Returned: Not later than 4:00 P.M.,
June 10, 1983.

Notes:

1. Proposal closing date must be shown on face of the envelope.
2. Proposals will be opened, not publicly, on June 13, 1983.

ISSUE DATE May 27, 1983

RETURN DATE June 10, 1983

VENDOR

Lach Brothers

Box 15A, R.R. 2

WINNIPEG, Manitoba

R3C 2E6

Signature of Authorized Official

Title

Prepared by

S. Parry
Contracts/Services Officer

A. PREAMBLE

1. Environmental Management of the Manitoba Government has identified a number of boulevards within the City of Winnipeg that contain contaminated soil, sod and other materials.

2. The contaminent is lead and is in concentrations of 2600 ppm. and greater.

3. Exposure to the contaminated materials over a short period of time is not considered harmful but continued exposure may be hazardous to the health of young children.

4. Protective clothing is not required by any personnel who may be involved in the removal of the contaminated material.

B. INTENT

1. It is the intent of the Manitoba Government to contract for the removal of all of the contaminated materials and restore the boulevards to a lead free condition similar to what they were prior to contamination.

2. The intent of this "Request for Proposal" is to solicit prices for the project and to establish the terms and conditions under which the project will be completed.

C. BIDDERS INSTRUCTIONS

1. Only those proposals submitted on the attached appendix will be considered.

2. All proposals must be complete, signed in ink by an authorized official of the Company, and received prior to proposal closing date and time.

3. All proposals must be valid for acceptance for 60 days after the closing date and time of this "Request for Proposal".

4. Bidders are to inspect the boulevards designated on the attached appendix to verify and confirm the information contained therein and to familiarize themselves with the actual site conditions.

D. TERMS AND CONDITIONS

1. Removal of contaminated material

a. All contaminated materials are to be excavated to a depth of 6" from those properties designated in the attached appendix.

b. Material will be cleared from around the roots of boulevard trees where feasible.

c. Material will be cleaned as close as possible to fences, concrete driveways, sidewalks, poles, buildings, or any other permanent object where removal is not practical or required.

d. Adequate precautions will be taken to ensure the full protection of all objects, trees, buildings, etc., that are not designated for removal.

e. Adequate precautions will be taken to ensure the full protection of utility lines, water lines, telephone cable, etc., that may be adjacent to the designated boulevards.

Note: The successful bidder, or contractor, will be required to ascertain the location of all buried cables, etc.

f. All excavated materials, including any designated plants, will be transported by the contractor immediately from the boulevards to the Brady Street landfill site.

1. Removal of contaminated material (continued)

   g. Transportation will be by way of covered trucks so as to prevent any spillage of material.

   h. All spillage of material on streets, sidewalks or adjacent properties will be cleaned up immediately by the contractor.

   i. All equipment, vehicles and tools used for the removal of the contaminated material must be cleaned thoroughly after use and prior to being used for any other purpose.

2. Landscaping

   a. Designated boulevards are to be landscaped after the contaminated materials have been removed.

   b. Top soil mixture under all areas that require sodding shall be spread evenly and compacted to provide a firm base free of air pockets.

   c. The top soil shall be natural, fertile, friable soil possessing characteristics of representative production soils in the vicinity. It shall be obtained from naturally well drained areas and shall not be excessively acid or alkaline, nor contain toxic substances which may be harmful to plant growth. It shall be without a mixture of subsoil, stones, stumps, roots, or similar substances, 2" and over in diameter, and debris or other objects which may be a hindrance to planting operations. Lead content must be less than 200 ppm.

   d. Depth of topsoil mixture shall be sufficient to allow for the laying of sod which will return the grade to its original level with due consideration given to proper drainage practices.

   e. Sod shall be #1 Nursery grown 50% Kentucky Blue, 50% Creeping Red Fescue Turf, strongly rooted and free from pernicious weeds, mosses and stones. It shall be free of disease, burned or bare spots and mechanical injury, and shall not be delivered in a frozen condition. It shall be mowed to a height of 2" before lifting and shall be of uniform thickness with not over 1½" or less than 3/4" of soil.

   f. Sod shall be laid closely knit together in such a manner that no open joints are visible and no pieces are overlapping.

   g. Sod shall be laid smooth and flush with adjoining areas and paving.

   h. All sodded areas are to be dressed and top seeded immediately after installation.

   i. After installation all areas shall be watered immediately with sufficient amounts to saturate the soil and topsoil.

   j. After sod and soil has dried sufficiently to prevent damage, the area shall be rolled with a roller to ensure a good bond between sod and soil and to remove minor depressions and irregularities.

   k. Maintenance of sodded areas shall begin immediately after installation and shall continue for 30 days after completion of all landscaping.

2. Landscaping (continued)

1. Maintenance shall include all measures necessary to establish and maintain sod in a vigorous growing condition including, but not limited to:

- mowing, watering, rolling and weed control as required to conform with good horticultural practice
- repair of any erosion occuring as a result of faulty workmanship and materials
- immediate repair of any sodded areas which show deterioration or bare spots

m. Driveway or parking locations shall be graded level with adjacent areas consistent with proper grading practices with due consideration to drainage requirements.

3. Site Conditions

a. Streets, sidewalks and adjacent properties shall be maintained free of spillage, soil debris, etc., at all times by the Contractor during the installation process.

b. Following completion of the contract, the Contractor shall remove all equipment and excess or waste material from the boulevards and shall leave them in a clean condition satisfactory to Environmental Management.

4. Inspection

a. All removal, landscaping and other activities related to the contract shall be subject to the ongoing inspection and approval of Environmental Management.

b. All replacement materials are subject to the approval of Environmental Management prior to installation.

c. Any work not satisfactory as specified shall be rectified by the Contractor.

5. Acceptance

a. On completion of the contract, a final inspection will be carried out and, if satisfactory, a letter of acceptance will be provided by Environmental Management.

6. Guarantee

a. All work specified above shall be guaranteed for 12 months against faulty workmanship or materials.

b. Any replacement materials and/or labour required to rectify unsatisfactory conditions during the terms of the guarantee shall be provided by the Contractor at no cost.

7. Liability

a. The successful bidder, or contracter, shall make good any and all damage to streets, sidewalks, trees, shrubs, plants, building, fences, utility lines, water lines, etc., caused by the Contractor or his agents during the performance of the contract at no cost to the Manitoba Government.

b. The successful bidder, or contractor, shall provide insurance to satisfy the following requirements:

i. To save harmless the Province from all claims and demands arising directly or indirectly out of or in connection with the Contractor's activities during the performance of this contract.

7. Liability (continued)

ii. To provide, maintain and pay for the following insurance which shall be placed with such insurance company or companies and in such form as may be acceptable to the Province:

aa. Comprehensive General Liability Insurance protecting the Province, the Contractor, his subcontractors and their respective servants, agents or employees against damages arising from personal injury and from claims for property damage which may arise directly or indirectly out of the operations of the Contractor, his subcontractors, servants, agents or employees under the contract. Such insurance shall be for an adequate amount acceptable to the Province and shall in any event be not less than $5,000,000.00 inclusive any one occurrence and shall include a standard form of cross liability clause.

bb. Automobile Insurance on the Contractor's owned and non-owned vehicles, protecting the Contractor and the Province against damage arising from bodily injury and from claims for property damage arising out of their use on the operations of the Contractor, his subcontractors or agents under this contract. Such insurance shall be for an adequate amount acceptable to the Province and shall in any event be not less than $5,000,000.00 inclusive in any one accident.

cc. Evidence of insurance in such form as may be required shall be lodged with the Province before the work is commenced.

8. Pricing

a. Prices are to include all removal of contaminated material, transportation to Brady Street landfill site, and landscaping.

b. Prices are to be separate for each of the boulevard segments by street as per the attached appendix.

c. Prices are to be Federal Sales Tax included and Manitoba Revenue Tax shown as an extra, if applicable.

9. Invoicing

a. Invoices are to be submitted to:

Environmental Management
Bldg. #2 - 139 Tuxedo Blvd.
Winnipeg, Manitoba
R3N 0H6

Attention: Dave Wotton
Telephone: 895-5311

b. Separate invoices are to be submitted for each street.

Note: A hold back of 15% of the total contract price will be retained by the Manitoba Government for 30 days after the period of maintenance has expired as indicated in D.2.k. and l. above.

10. Time Frames

a. June 20, 1983 is the anticipated starting date for the work specified.

b. The work is to be completed within three (3) weeks of start date.

11. Award of Contract

a. Award notification will be by way of a Purchase Order issued by the Manitoba Government Purchasing Branch.

b. The award will be made to the bidder who most closely meets the terms and conditions of this "Request for Proposal".

12. Contact Persons

a. Any questions pertaining to the commercial aspects of this "Request for Proposal" shall be directed to:

S. Parry
Contracts/Services Officer
Department of Government Services
Purchasing Branch
530 Century Street
Winnipeg, Manitoba
R3C 0V8

Telephone: 944-0070

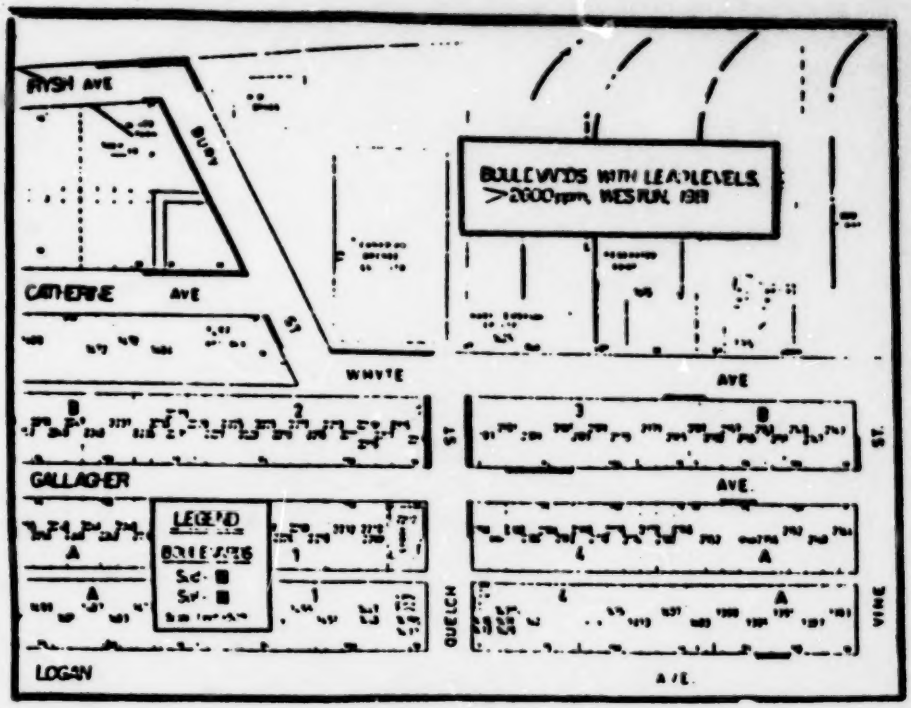
b. All other questions shall be directed to:

D. Wotton
Environmental Officer
Environmental Management
Bldg. #2 - 139 Tuxedo Blvd.
Winnipeg, Manitoba
R3N 0H6

Telephone: 895-5311

c. Arrangements to view the properties are to be made through D. Wotton, as shown above, who will also arrange and be responsible for all inspections, letter of acceptance, and liaise with the property owners.

APPENDIX



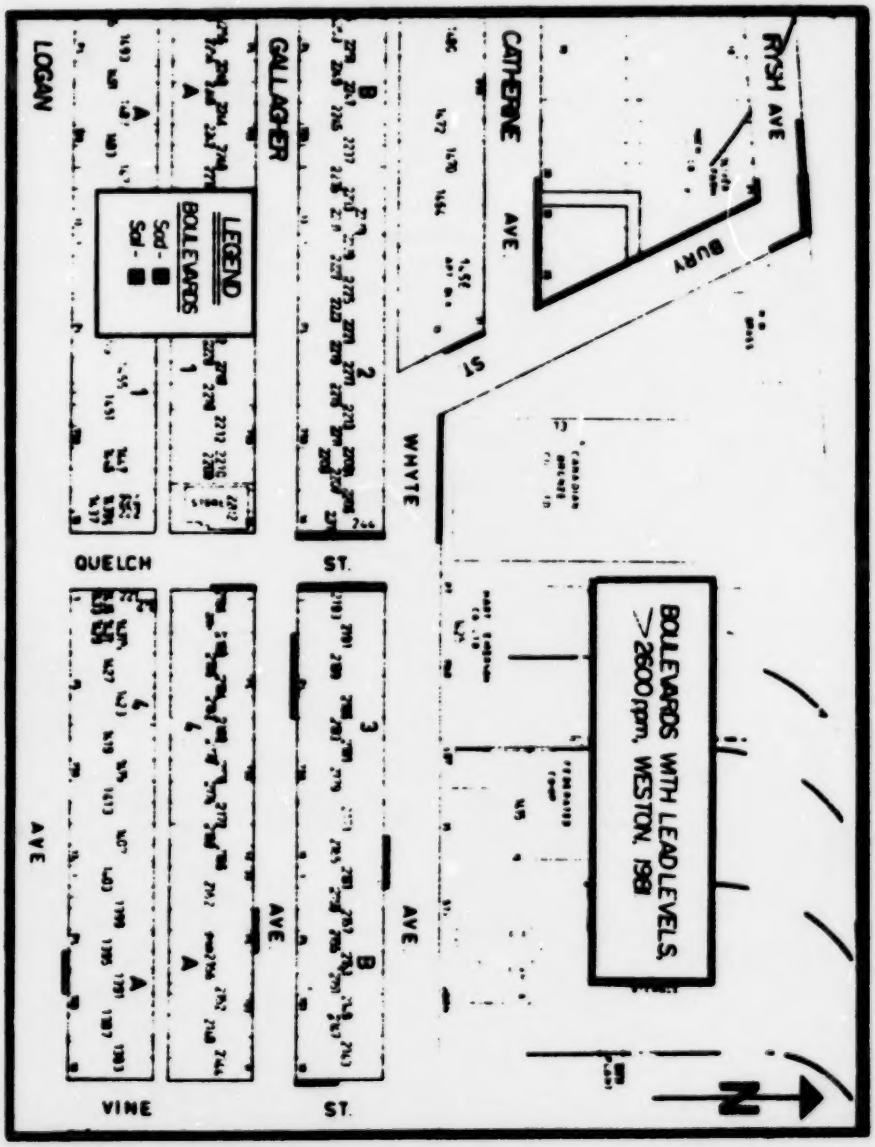
SOIL/SOD REMOVAL - WESTON AREA BOULEVARDS

LOCATION OF CONTAMINATED BOULEVARD AREAS:

		QUOTED PRICE
Irysh Avenue:	3 - 50' parcels located along the north side at the east end of Irysh Avenue. 200 s.yds. FOR	1,050.00
Bury Street:	8 - 50' parcels located along the northeast end, the west side between Bury Street and Catherine Avenue and the west side between Catherine Avenue and Whyte Avenue. 756 s.yds. FOR	3,969.00
Catherine Avenue:	3 - 50' parcels located along the north side at the east end of Catherine Avenue. 250 s.yds. FOR	1,312.50
Whyte Avenue:	3 - 50' parcels located along the north side at the west end and on the south side along the back properties of 2161 and 2165 Gallagher Avenue. 350 s.yds. FOR	1,837.50
Quelch Avenue:	5 - 50' parcels located along both east and west sides between Whyte Avenue and Gallagher Avenue and along the east side between Gallagher Avenue and Logan Avenue. 417 s.yds. FOR	2,189.25
Gallagher Avenue:	3 - 50' parcels located along the north side east of Quelch Avenue in front of properties 2191, 2189 and 2185 Gallagher Avenue and along the south side east of Quelch Avenue in front of property 2158 Gallagher Avenue. 195 s.yds. FOR	1,023.75
Logan Avenue:	1 - 50' parcel located along the north side in front of properties 1391 and 1395 Logan Avenue. 20 s.yds. FOR	105.00
Vine Street:	1 - 50 parcel located along the west side between Whyte Avenue and Gallagher Avenue. 112 s.yds. FOR	588.00
	TOTAL	12,075.00

Appendix II

Map Of Boulevard Removal/Replacement Sites



APPENDIX III

Summary of Lead Concentrations in Boulevard Sod and Soil

Street and Boulevard Section	Lead Concentration (µg/g)			
	Sod		Soil	
	Pre-Replacement	Post-Replacement	Pre-Replacement	Post-Replacement
Catherine Ave.				
4	2800	40		30
5	3400	40		20
6	3700	30		20
Irysh Ave.				
2		40	2800	20
3	6000	30	6800	20
6		40	2800	40
Bury St.				
1		60	4100	40
11		31	3800	31
12		40	4400	150
13		80	3800	40
14		50	3200	40
15		50	4400	40
16		30	3400	30
17		40	2900	20
Whyte Ave.				
1	2800	30	3000	30
2		40	3800	40
7	2800	40		100
Vine St.				
2	3700	60	3000	70
Quelch St.				
1	4400	40	4800	20
2	2800	40		30
3	3000	40		20
5	3800	30	3200	30
6	3400	40	2700	50
Gallagher Ave.				
9	3200	40		20
10	2800	30		20
23	2800	30		20
Logan Ave.				
8	2800		40	110

APPENDIX IV

Laboratory Processing and Analysis Procedures

Sod and soil samples were taken to the W. M. Ward Technical Services Laboratory, 745 logan Avenue, Winnipeg, Manitoba for processing and analyses. Samples were placed into individual acid washed glass beakers and then oven dried at 100°C for about 24 hours.

The dried samples were ground to a medium texture using a mortar and pestle and then screened through a Canadian Standard stainless steel no. 7 size sieve. This separated soil material was then reground by mortar and pestle and screened through a no. 80 size sieve. For each sample the mortar and pestle were washed with tap water and wiped dry using clean paper towels. The sieves were air blown to remove fine soil particles and then wiped using clean gauze pads.

The dust-like sod and soil samples were placed into individual sterile glass specimen vials and submitted for analysis of total lead concentration by atomic absorption spectrophotometry.

POOR

QUALITY

ORIGINAL